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INTEGRATED REMOTE HEALTH SYSTEM FOR ANALYZING COMATOSE PATIENTS

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ABSTRACT :

A patient who is unconscious and unable to move or speak is said to be in a coma. These patients need to be monitored continuously and given quick attention. Once a patient enters the comatose stage, it is really difficult to predict when he/she will be out of it. It may be within days, weeks, or may even take months and years together. Physiological condition monitoring is an indispensable part of comatose patient treatment. Unfortunately, the bedside monitor, a tool which is commonly used to detect the patients' vital sign is only readable by medical officers and need to be observed at a close distance. We offer a system that continuously records and observes patient data without the need for human involvement. This system designed and developed a reliable, energy efficient for sending alert message to the concern person when person in coma. The system used smart sensors like pulse sensor, wetness sensor and eye blink sensor.

Keywords: Coma, sensor, monitoring ,,.

1. INTRODUCTION :

Patients who are comatose are unconscious and unable to react to their surroundings. This can happen for a number of causes, including serious infection, traumatic brain injury, stroke, drug overdose, and stroke. In order to spot any changes in their condition that could point to a life threatening circumstance, patients in a comatose state need to have their vital signs continuously monitored. Due to this situation, it becomes difficult for the hospital staff to monitor and keep watch over the patient at all times and thus slight body movements and life-like indications or abnormal activities may go unnoticed. The Internet of Things is a rising subject of specialized, social, and financial essentialness. IOT includes in different offices like Medical businesses, Automobile ventures, Manufacturing enterprises, and so forth. The goal of this project is to create a system that will make it easy for the family of comatose patients to check their vital signs without constantly needing to be near hospitalized patients in intensive care units (ICUs). All these parameters can be monitored by the user from remote locations with the help of Blynk app.

2. LITERATURE SURVEY :

Jahanzaib Latif Chuangbai Xiao; Shanshan Tu; Sadaqat Ur Rehman; Azhar Imran; Anas Bilal [1] presented Implementation and Use of Disease Diagnosis Systems for Electronic Medical Records Based on Machine Learning. Electronic health records are used to extract patient's information instantly and remotely, which can help to keep track of patients' due dates for checkups, immunizations, and to monitor health performance. The Health Insurance Portability and Accountability Act (HIPAA) in the USA protects the patient data confidentiality, but it can be used if data is re-identified using `HIPAA Safe Harbor' technique. Usually, this re-identification is performed manually, which is very laborious and time captivating exertion.

Stephanie Baker; Wei Xiang [2] presented Artificial Intelligence of Things for Smarter Healthcare: A Survey of Advancements, Challenges, and Opportunities. Healthcare systems are under increasing strain due to a myriad of factors, from a steadily ageing global population to the current COVID-19 pandemic. In a world where we have needed to be connected but apart, the need for enhanced remote and at-home healthcare has become clear. The Internet of Things (IoT) offers a promising solution. The IoT has created a highly connected world, with billions of devices collecting and communicating data from a range of applications, including healthcare.

Abdullah Al Mamun; Sami Azam; Clementine Gritti [3] presented Blockchain-Based Electronic Health Records Management: A Comprehensive Review and Future Research Direction. Electronic Health Records (EHRs) are electronically-stored health information in a digital format. EHRs are typically shared among healthcare stakeholders and face power failure, data misuse, lack of privacy, security, and audit trail.

Guangyu Peng; Aiqing Zhang; Xiaodong Lin [4] presented Patient-Centric Fine-Grained Access Control for Electronic Medical Record Sharing With Security via Dual-Blockchain. Electronic medical record (EMR) sharing allows doctors to access patients' historical EMRs from different hospitals, improving the quality of healthcare services. The cloud-based centralized EMR sharing improves sharing efficiency but has the risk of privacy leakage.

3. EXISTING METHODOLOGY :

The system continually monitors the patient's vital signs and movement in the bed using a variety of sensors, including heart rate, blood pressure, temperature, respiration, and PIR sensors. Videos or images of the patient may be taken using a camera for monitoring and assessment. The gathered data is wirelessly transferred to an embedded Raspberry Pi device, which analyses and uploads to a cloud server. The patient's data is stored on a cloud server, notifying medical personnel of unusual readings or movements.

3.1 Block Diagram

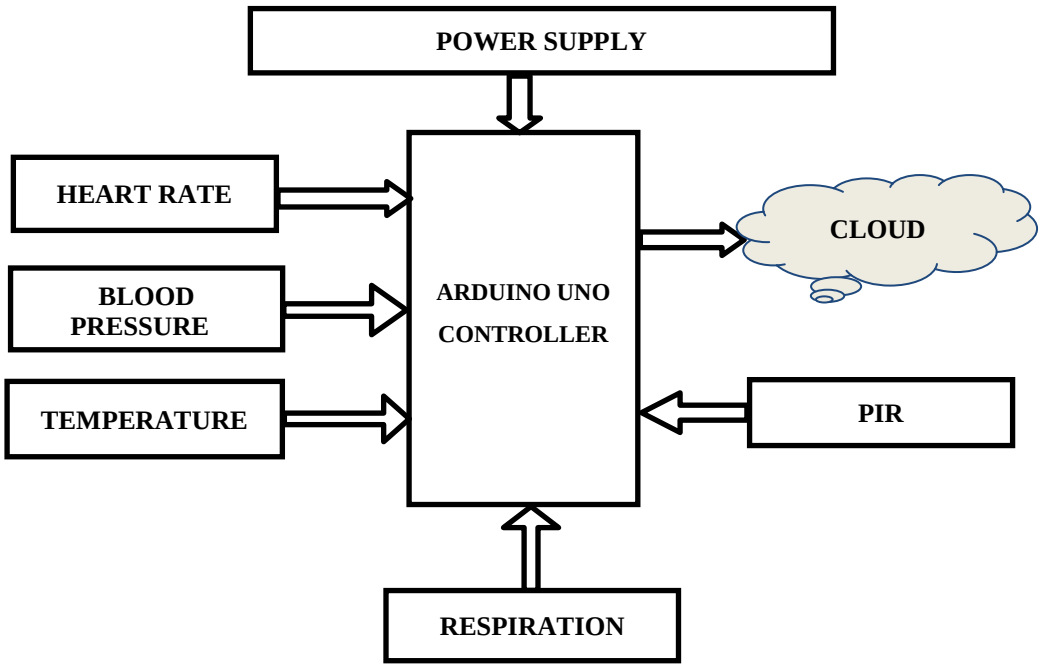

Fig 3.1 : BLOCK DIAGRAM OF EXISTING SYSTEM

4. PROPOSED METHODOLOGY

The patient and doctor smart phone or computers are used as a monitoring device. The sensors are used to measure the health parameters of patient after these parameters are acts as readings and finally converted into signals. These signals are provided for processing to ESP 32. Then controller displays the information on a monitor and also stores the information over the cloud with the help of IoT. This information can be accessed by the doctor on his phone/computer and get the notification. Also there is facility provided to send an alert message to the doctor or patient caregiver if any abnormal data is detected.The patient and doctor smart phone or computers are used as a monitoring device. The sensors are used to measure the health parameters of patient after these parameters are acts as readings and finally converted into signals. These signals are provided for processing to ESP 32. Then controller displays the information on a monitor and also stores the information over the cloud with the help of IoT.This information can be accessed by the doctor on his phone/computer and get the notification. Also there is facility provided to send an alert message to the doctor or patient caregiver if any abnormal data is detected.

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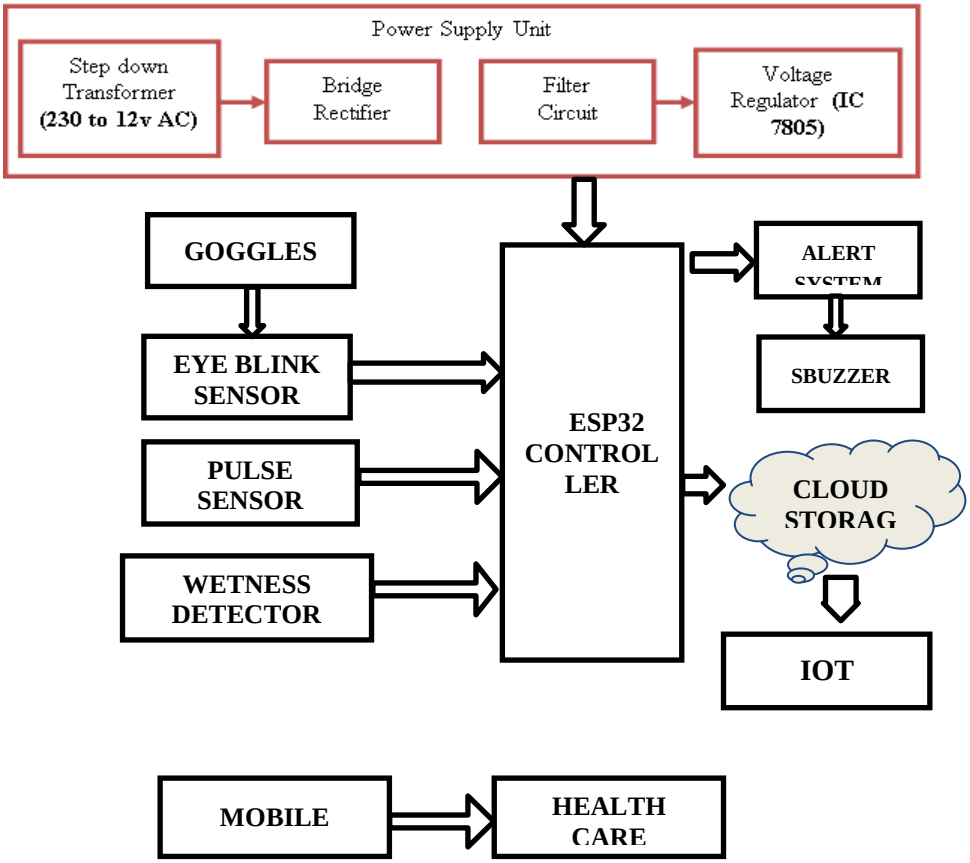

Fig 3.1 : BLOCK DIAGRAM OF PROPOSED SYSTEM

4.2 Advantages of Proposed System

- The workload of medical staff can be greatly reduced by the IoT-based monitoring system.
- Reliable and cost effective
- User friendly, promotes remote monitoring.

5. HARDWARE REQUIREMENTS

- Transformer
- Bridge Rectifier
- Filter Circuit
- Ic 7812
- Ic 7805
- Eyeblink Sensor
- Pulse Sensor
- Wet Sensor
- Microcontroller Esp 32
- Buzzer
- Mobile

6. SOFTWARE REQUIREMENTS

- Embedded C
- Arduino Ide
- Blynk App

7. CONCLUSION

To summarize, the Integrated Remote Health System is a ground-breaking development in healthcare technology, specifically designed to handle the significant issues connected with studying comatose patients. This unique system, which uses advanced sensors, data analytics, and telemedicine capabilities, provides healthcare professionals with unprecedented access to real-time patient data and insights, even from faraway places. The system's ability to continually monitor vital signs, brain activity, and other crucial indicators allows for timely and precise information, resulting in early detection of issues and informed clinical decision-making. Its user-friendly interface and customized notifications enable healthcare professionals to respond quickly to changes in patient condition, thereby improving patient outcomes and lowering the risk of complications

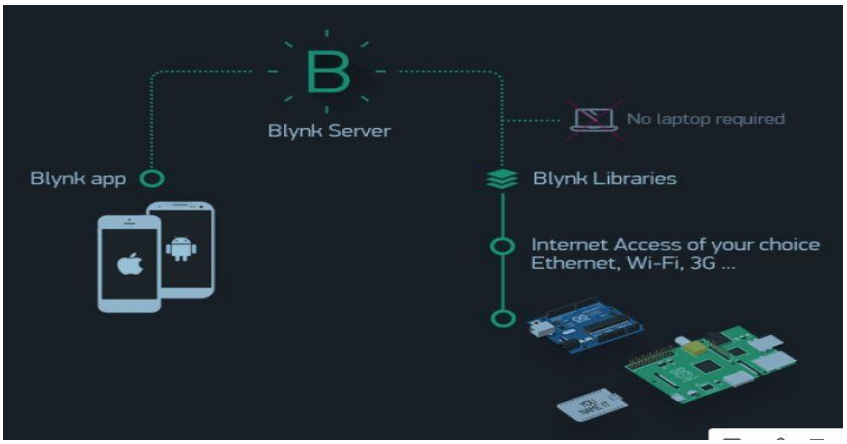

Fig 7.1 : METHODOLOGY OF PROPOSED SYSTEM

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